

Application. No. 09/892,860

### REMARKS/ARGUMENTS

This letter is responsive to the Office Action dated **December 10, 2002**. Under a separate cover sheet, Applicant encloses a request for a three-month extension of time.

Applicant has amended claim 1 to positively introduce the membrane filter and the mixed liquor in response to the Examiner's objections under 35 U.S.C. 112. Claim 6 has been amended to correct that the mixed liquor to be passed through the screen is removed from the recycle mixed liquor stream upstream—and not downstream as originally presented in claim 6—of where the screened mixed liquor flows back to the recycle mixed liquor stream. The changes to claims 1 and 6 are fully supported from the description and figures of the patent application as filed and do not add any new subject matter to this application. The specification has been amended to reflect the correction to claim 6.

The Examiner rejected claims 1, and 3-20 under 35 U.S.C. 112, first paragraph, as based on a disclosure that is not enabling. Specifically, the Examiner indicated that the step of treating the screened water through the membrane is critical or essential to the practice of the invention, but is not included in the claims(s) and is not enabled by the disclosure.

Applicant submits that the invention relates to a side stream in a waste water treatment system wherein the mixed liquor in the side stream is screened to remove hair, trash, or fibrous materials, and wherein the side stream is taken from and returned to any portion of the waste water treatment system (see, for example, paragraphs [0020] and [0021] of the specification). This is possible since the screen 32 of the invention removes hair, trash, or fibrous materials in the mixed liquor based on an average removal of these materials over a solids

retention time of the entire bioreactor. The waste water treatment system of this invention uses a filter, such as, for example, a membrane filter or a hollow fibre membrane filter (see, for example, paragraph [0016] of the specification) as would be known to those skilled in the art.

Since the waste water treatment system of this invention uses a membrane filter, however, Applicant has amended claim 1 to positively recite that the waste water treatment system has a membrane filter. Claims 3-20 depend from amended claim 1, and therefore also benefit from this amendment.

The Examiner rejected claims 1-20 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has also indicated that the step of treating by a membrane, producing a permeate and retentate is not included in the claims and the claims are therefore incomplete.

As Applicant has submitted above, this invention relates to a side stream in a waste water treatment system wherein the mixed liquor in the side stream is screened to remove hair, trash, or fibrous materials, and wherein the side stream is taken from and returned to any portion of the waste water treatment system. The waste water treatment system of this invention uses a filter, such as, for example, a membrane filter or a hollow fibre membrane filter as would be known to those skilled in the art. Therefore the step of treating by a membrane to produce a permeate and retentate is inherent to the waste water treatment system of this invention and would be understood by one skilled in the art.

The Examiner indicated that the term 'mixed liquor' in the claims is unclear as to whether permeate, retentate, or waste water feed stream is intended.

Applicant submits that the term 'mixed liquor' is a term well known by a person skilled in the art as a mixture of raw waste water and activated sludge. The specification is clear that the mixed liquor for this invention can be drawn from a number of places in the waste water treatment system, but not the influent of water to be treated (see, for example, paragraph [0018], paragraph [0008], paragraph [0020], and paragraph [0021] of the specification).

The Examiner indicated that claim 1 is unclear as to whether the waste water to be treated by the system is first treated by the screen and further the treated water is filtered by a membrane in the system. The Examiner has also indicated that claim 6 is unclear as to what is intended.

Applicant has amended claim 1 to clarify that the mixed liquor is produced in the waste water treatment system, and that a portion of the mixed liquor is removed for screening before the screened mixed liquor is flowed back to the waste water treatment system. This should clarify the invention for the Examiner. Since claims 2–20 depend from amended claim 1, they benefit from this amendment. Claim 6 has been amended as indicated above, which, applicant submits addresses the Examiner's objection.

The Examiner rejected claims 1, 5, 6, 10, 18, and 19 for having insufficient antecedent basis for the limitation 'mixed liquor.' Applicant has amended step (b) of claim 1 to provide antecedent basis for the limitation 'mixed liquor.' Claims 5, 6, 10, 18, and 19 depend from amended claim 1, and therefore benefit from this amendment.

The Examiner has rejected claims 1–9, 11–15, and 18–20 under 35 U.S.C. 103(a) as being unpatentable over US 5,578,213 (hereinafter Miller et al.). The Examiner states that Miller et al. discloses a process of treating waste-water containing hair fibrous material or trash (e.g., marine gray water). The process includes the steps of treating the waste-water with a screen or strainer prior to

passage through a membrane filter, or cross flow filter having a pore size of less than 0.5 microns (e.g., reverse osmosis is also disclosed). The screen mesh size is 0.002 to 0.02 inch. The Examiner states that the water flow rate through the screen as claimed in claims 1, 11, 12, and 20 is not disclosed in Miller et al., however, the Examiner argued that it would have been obvious to one skilled in the art at the time the invention was made to expect a water flow in the screening step, substantially similar to the flow rate in Miller et al., since Miller et al. uses the same size of meshes or openings in the screen as claimed in the present invention, and considering the same degree of contaminants concentration and operating pressure in both the Miller et al. reference and the present invention.

As Applicant has submitted above, this invention relates to a side stream in a waste water treatment system wherein the mixed liquor in the side stream is screened to remove hair, trash, or fibrous materials.

In contrast to the instant invention, Miller et al. generally relates to a process where the individual treatment stages are arranged in series. More specifically, Miller et al. pretreats the waste water feed inlet with a screen or strainer *prior* to passage through a first filtration medium. Accordingly, the screening system must be designed to accommodate the waste-water feed inlet flow under peak conditions which can typically be three or more times the average design flow rate of the system. The process of the instant invention generally relates to a process with a side stream for treating a portion of the mixed liquor with a screen. More specifically, amended claim 1 provides for (a) flowing water to be treated to the waste water treatment system having a membrane filter; (b) treating the water in the waste water treatment system and producing a mixed liquor; (c) removing a portion of the mixed liquor from the waste water treatment system and passing the mixed liquor through a screen to remove hair, trash, or fibrous materials from the mixed liquor; and (d) flowing the screened mixed liquor to the waste water treatment system. Since only a portion of the mixed liquor passes through the screen, the average flow rate of the mixed liquor through the screen

is not more than about 1.0 of the average design flow rate of the waste water treatment system.

Miller et al. does not teach a side stream for treating a portion of the mixed liquor with a screen, nor is there any suggestion or motivation in the reference or in the knowledge generally available to one of ordinary skill in the art to modify Miller et al. to arrive at same. Accordingly, it is respectfully submitted that Miller et al. relates to a completely different process and should not be considered in determining the patentability of the instant invention.

The Examiner has rejected claims 16 and 17 under 35 U.S.C. 103(a) as being unpatentable over Miller et al. and further in view of US 6,675,377 (hereinafter Fox), and the Examiner has rejected claim 10 under 35 U.S.C. 103(a) as being unpatentable over Miller et al. and further in view of US 5,637,221 (hereinafter Coyne). Applicant submits that since Miller et al. is not applicable to the underlying claims that these claims relate to, that these objections do not apply.

The Examiner has rejected claims 1, 2, 7, 8, 9, 10, 12, 18, and 20 under 35 U.S.C. 103(a) as being unpatentable over US 4,071,445 (hereinafter Katayama et al.). Applicant notes that this reference was not provided in the Notice of References Cited nor applicant's own prior Information Disclosure Statements. For completeness of record, applicant provides a further Information Disclosure Statement listing this reference. Since the Examiner in the official communication relied upon this reference, applicant submits that no fee is required. Will the Examiner please acknowledge this Information Disclosure Statement.

The Examiner states that Katayama et al. discloses treating waste-water having the claimed components (e.g., gray water including water from wash tubs which includes hair) by screening with a coarse filter and further treating with a semi-permeable membrane. The average flow rate is not disclosed. However, the Examiner argued that it would have been obvious to one skilled in the art at the

time the invention was made to adjust the screen mesh size in order to remove specific particle size from the water, screen filters capable of retaining hair are well known in the art (as evidenced by Miller et al.).

Again, in contrast to the instant invention, Katayama et al. generally relates to a process where the individual treatment stages are arranged in series. More specifically, Katayama et al. pretreats the waste-water feed inlet with a coarse filter *prior* to passage through a semi-permeable membrane. Accordingly, the screening system must be designed to accommodate the waste-water feed inlet flow under peak conditions which can typically be three or more times the average design flow rate of the system. The process of the instant invention generally relates to a process with a side stream for treating a portion of the mixed liquor with a screen. More specifically, the invention removes a portion of the mixed liquor from the waste water treatment system, passes the mixed liquor through a screen to remove hair, trash, or fibrous materials from the mixed liquor, and flows the screened mixed liquor to the waste water treatment system upstream of the membrane filter. Since only a portion of the mixed liquor passes through the screen, the average flow rate of the mixed liquor through the screen is not more than about 1.0 of the average design flow rate of the waste water treatment system. Katayama et al. does not teach a side stream for treating a portion of the mixed liquor with a screen, nor is there any suggestion or motivation in the reference or in the knowledge generally available to one of ordinary skill in the art to modify the reference to arrive at same. Accordingly, it is respectfully submitted that Katayama et al. relates to a completely different process and should not be considered in determining the patentability of the instant invention.

Applicant submits that none of the references, either singly, or as combined by the Examiner, provide the invention as claimed in amended claim 1, namely, (a) flowing water to be treated to the waste water treatment system having a membrane filter; (b) treating the water in the waste water treatment system and

producing a mixed liquor; (c) removing a portion of the mixed liquor from the waste water treatment system and passing the mixed liquor through a screen to remove hair, trash, or fibrous materials from the mixed liquor; and (d) flowing the screened mixed liquor to the waste water treatment system. Since only a portion of the mixed liquor passes through the screen, the average flow rate of the mixed liquor through the screen is not more than about 1.0 of the average design flow rate of the waste water treatment system.

In view of the foregoing, a timely notice of allowance is respectfully requested. Should the Examiner deem it beneficial to discuss the application in greater detail, she is kindly requested to contact the undersigned by telephone at (416) 957-1697 at her convenience.

Respectfully submitted,

Bereskin & Parr

By



Stephen M. Beney  
Reg. No. 41,563  
Tel: (416) 957-1697